

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
1 September 2005 (01.09.2005)

PCT

(10) International Publication Number
WO 2005/081320 A1

(51) International Patent Classification⁷: **H01L 29/165**,
21/20

(21) International Application Number:
PCT/GB2005/000490

(22) International Filing Date: 14 February 2005 (14.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0403190.2 13 February 2004 (13.02.2004) GB

(71) Applicant (for all designated States except US): **IQE SIL-
ICON COMPOUNDS LTD** [GB/GB]; Beech House, Cy-
press Drive, St Mellons, Cardiff CF2 0LW (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **FISHER, Maurice,
Howard** [GB/GB]; 7 Deansfield, Cricklade, Wiltshire SN6
6BP (GB). **ROUMIGUIERES, Benoit, Alfred, Louis**
[FR/GB]; 12 Clos Cwn Creunant, Pontprennau, Cardiff
CF23 8LA (GB). **MORGAN, Aled, Owen** [GB/GB]; 38
Victoria Avenue, Canton, Cardiff CF5 1ET (GB).

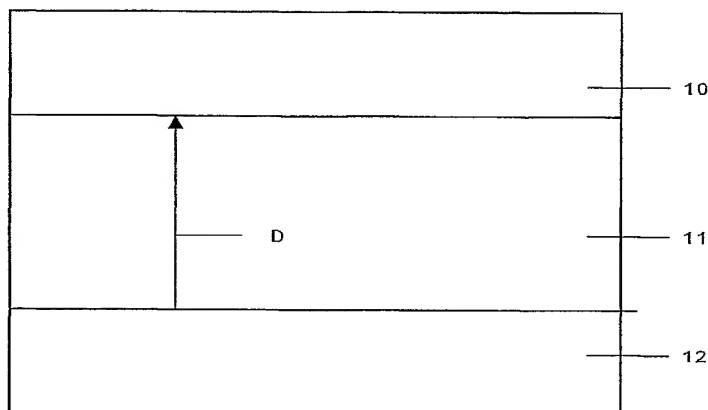
(74) Agent: **CAWDELL, Karen, Teresa**; Urquhart-Dykes
& Lord LLP, Three Trinity Court, 21-27 Newport Road,
Cardiff CF24 0AA (GB).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: COMPOUND SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING THE SAME



(57) Abstract: A semiconductor device comprises an Si substrate (10) and a compound layer (11) of $\text{Si}_{1-x}\text{Ge}_x$ disposed on the sub-
strate (10). X is varied from 0 to 0.2 away from the substrate (10) towards the upper surface of the compound layer (11), with the
rate of change of X increasing through the layer. The increasing rate of change of X significantly improves the defectivity levels and
the surf ace roughness at the surf ace of layer (11).

WO 2005/081320 A1



Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.